

## ABSTRACT

An apparatus and method for detecting pattern defects and/or particles on the front surface of a semiconductor wafer having repetitive patterns includes a laser for illuminating an area on the front surface with a beam of polarized light. A lens collects light scattered from the area and forms a Fourier diffraction pattern of the area illuminated. A Fourier mask blocks out scattered light collected by the lens at locations in the Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaves in light at locations where the intensity is below the threshold level indicative of possible particle information. The Fourier mask includes a spatial light modulator and a polarization discriminator. The lens also images the area illuminated onto a camera using scattered light collected from the area by the lens and not blocked out by the Fourier mask. In one embodiment of the invention the spatial light modulator is optically addressable and in other embodiments of the invention the spatial light modulator is electrically addressable.

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